

ABSTRACT

An apparatus and method for a multilayer silicon over insulator (SOI) device is provided. In the multilayer SOI device, the crystal orientation of at least one active region of a device is different than the active region of at least another device. Where the multilayer SOI device has a first layer including a PMOS device with a silicon active region having a crystal orientation of [100], the second layer may be an NMOS device with a active region having a silicon layer having a crystal orientation of [110]. The second layer is bonded to the first layer. The method and apparatus can be extended to more than two layers thus forming a multilayer SOI device having a different crystal orientation at each layer. The multiple layer SOI device may form circuits of reduced surface area.